THE PLANT DISEASE REPORTER

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BUREAU OF PLANT INDUSTRY

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THE PLANT DISEASE REPORTER

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THE PLANT DISEASE SURVEY

Vol. IX July 1, 1925 Number 2

FROST INJURY TO CEREALS

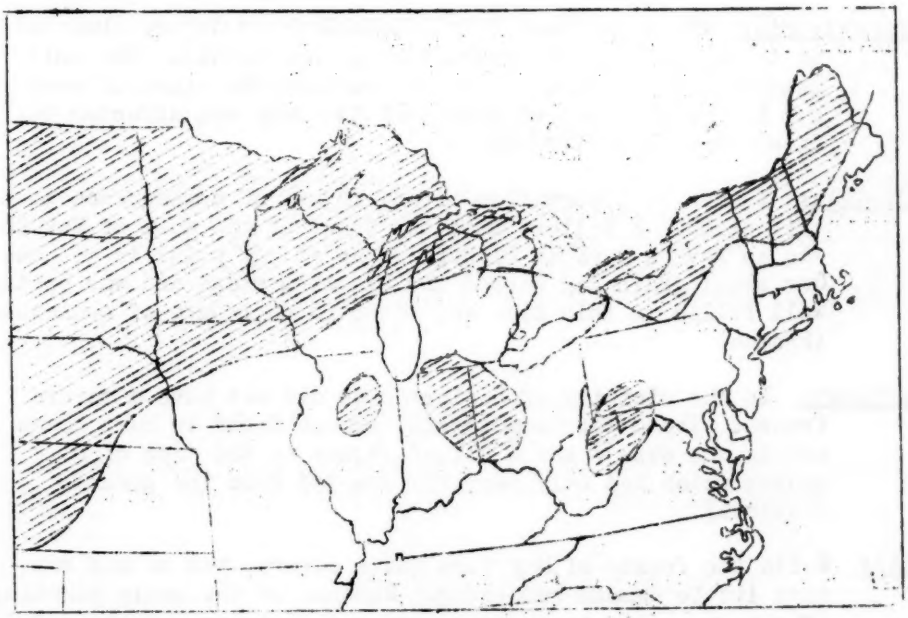

Fig. I. Areas where freezing temperatures occurred during May. Those in Illinois, Indiana, Ohio, and West Virginia took place during the week ending May 26. (U. S. Dept. Agr. Weekly Weather and Crop Bul. 1925)

A number of collaborators have replied to the questions asked concerning damage to cereal crops from freezing temperatures during May. According to their replies and also judging from the accompanying map, Figure I, the freezing injury was not general but more or less localized, occurring par-

ticularly in the Ohio Valley states of Illinois, Indiana, Ohio, and West Virginia. Collaborators in these states who have the opportunity to do so, may be able to make some interesting observations on the aftereffects of the frost. Some of the reports are as follows:

Maine: There was no damage from low temperature to grains here at Orono or in the southwestern part of the state at Highmoor Farm, or in the northeastern part of the state at Aroostook Farm. (Folsom)

Massachusetts: The only report of frost injury to grains which has come to our notice this year was the total killing of corn in a few restricted areas. (Osmun)

Connecticut: We have no records of injury in this state. There may have been some local injuries but we have not heard of them as yet. (Clinton)

Pennsylvania: There has been little actual frost injury observed by me in any part of the state during this period. The cold weather delayed germination and reduced the stand of corn but I have seen no evidence that the crop was affected by frost directly. (McCubbin)

Virginia: I have no information of any injury of consequence in this state. I believe that the frost of the week of May 26 was as severe here at Blacksburg as at any point in the state. Our small grain had passed the blooming stage and was pretty well filled at this time and there is no injury of consequence. (Fromme)

Kentucky: In the vicinity of Lexington we did not have a severe freeze. There was occasionally enough frost to hurt beans and in one case I saw a slight injury to the tips of corn leaves which had only recently emerged from the ground. (Valleau)

Ohio: While the frosts of May were quite severe, yet we had but very little damage resulting. Because of the early planting of oats we estimate that it suffered most, corn next, and wheat the least. The wheat varieties that are most planted in this state are Trumbull, Poole, Fultz, and Gladden, and about 1% of the acreage, Leap's Prolific. The latter is the most susceptible to frost injury. Another condition which undoubtedly prevented more loss in wheat in this state was the early seeding, as we found this year, early seeded wheat stood the frost better than late seeded wheat. (H. C. Young)

Indiana: I have seen quite a number of wheat fields in the last few days and find that the plants in many of the fields are

frozen badly. The freezing damage to the tissues has not affected the transpiration activities but most certainly will affect the movement of carbohydrates in the wheat plant. The culms are frozen within an inch of each joint and the most damage has occurred in the second internode from the top. The heads were mostly in the boots at the time of freezing but many of them have emerged since then and yesterday the stamens were developing on these heads. In 1913 I had the opportunity to study many plants which no doubt were frozen in a similar manner and which later developed a rot in this same part, due to Sporotrichum poae. (Hoffer)

Missouri: Wheat and corn injured considerably. Wheat was in blossom here and according to reports, the injury was mostly to the heads. (Maneval)

South Dakota: At Brookings, the most outstanding thing noted on the cereals was the injury from the frost which occurred on the evening of May 16. Rather severe injury was noted on the various cereals, including wheat, oats, barley, rye, and flax, especially the flax which showed only the cotyledonary leaves. The early sown flax which showed from 10 to 16 true leaves had withstood the frost apparently almost without injury. (A. G. Johnson)

Nebraska: There has been no damage occurring here. The Agronomy Department advises me that there is a slight amount of damage to the leaves of corn and some small grain, but that they will recover and that it will not affect the crop. I do not, however, have any information regarding conditions in western Nebraska. (Goss)

STEM RUST OF CEREALS

The prevalence and extent of stem rust infection of cereals are indicated in the following quotations from the Rust Reporter:

"General Epidemic Extends To South Dakota, North Dakota, Iowa, and Minnesota"

"Stem rust can now be found in nearly every wheat field in central Kansas, eastern Nebraska, and southeastern South Dakota. Traces may be found in occasional fields in Iowa, Minnesota, and North Dakota. No stem rust has been observed on oats north of Kansas.

"In Nebraska, on June 19, there was 'a scattering of P. gr. tritici in the eastern half of Nebraska but very rare'.

"In Illinois June 20 there was 'just a trace of stem rust in the uredinial stage on wheat through the southern half of the state. It was comparatively heavier through the western part of Illinois as far north as Macomb in McDonough County.'

"In South Dakota stem rust was first found on H. jubatum near Beresford, Union Co. On June 20 traces of stem rust were developing in most of the fields in the southern part of the state. In North Dakota a few pustules of rust developed on wheat near Fargo on June 15 -- on June 22 was reported by Cromwell as far north as Grand Forks. It is not known how far west the stem rust is developing.

"In Minnesota, stem rust was found in three fields out of ten near St. Paul on June 17. On June 20 it was found by Cromwell in several fields for ten miles east of Moorhead.

"In Iowa traces of stem rust were found on wheat June 19, near Ames.

"Montana reports no stem rust. No reports were received from Indiana, Wyoming, and Colorado."

"Possible Sources of Rust"

"It is estimated that the inoculum which caused the first infection in Minnesota and North Dakota could not have been produced later than June 8 to 10. At that time the only known sources of stem rust were: (1) aeciospores on barberries throughout the eradication area; (2) uredinial infection traceable to barberries in Kansas, Missouri, Nebraska, Wisconsin, and Illinois; (3) trace infections general in the fields of northern Texas, Oklahoma, and Kansas; and (4) a few heavily rusted spots in southern Illinois."

"Weather and Condition of Small Grains"

"During the week ending June 16, good rains over most of the winter wheat belt were too late to be of much benefit to the crop or the rust. Harvesting has begun in northern Kansas, central Missouri, southern Illinois, and Indiana.

"In most of the spring wheat belt rains, warm weather, and heavy dews have been very favorable for stem rust development. The small grains in this region are in excellent condition, having recovered for the most part from the effects of a partial drought early in the spring." (Rust Reporter, June 23)

"Texas and Oklahoma Conditions"

"Very little stem rust developed on wheat in Texas and Oklahoma this year. Most fields matured with only a trace of stem rust on a small percentage of the plants. With a few exceptions the same conditions existed in fields of oats. The heaviest stem rust infection on wheat was noted near Fort Worth in Texas and near Temple and Waurika, Okla. At these points a small percentage of the plants were infected as high as 5%. In one low field near Temple, Oklahoma, the infection ran as high as trace to 20% abundant. On oats the heaviest infection was found near Grand View, Texas, and Apache, Oklahoma. The infected field at Grand View averaged 1% on 10% of the plants. Stem rust had been located in this field in January and the rust apparently overwintered there." (Rust Reporter, June 15)

The accompanying tables give a comparison of dates of earliest appearance in 1924 and 1925; the dates of first observation of rust on barberry in 1925; and the first reports of the spread of rust to cereals and grasses from barberries in 1925.

Table 1. Rust on barberries, 1924 and 1925 (first reports).

State	1925	1924
Ohio	April 18 - Pycnia April 27 - Aecial cups	May 9 - Pycnia May 15 - Aecia
Indiana	May 12 - Aecia	May 3 - Pycnia
Illinois	May 4 - Pycnia	May 10 - Pycnia
Michigan	April 25	May 26 - Aecia
Wisconsin	April 27 - Pycnia	April 29 - Pycnia
Minnesota	May 1 - Pycnia	May 12 - Pycnia June 2 - Aecia
Iowa	April 23 - Aecia	April 26 - Pycnia
Missouri	April 25 - Pycnia & Aecia	April 29 - Pycnia
North Dakota	June 2 - Aecial cups	- - - - - - -
South Dakota	May 9 - Pycnia & Aecia	May 21 - Pycnia
Nebraska	April 26	May 14 - Pycnia
Kansas	May 30 - Pycnia	May 19 - Aecia

THE FLAGSMUT SITUATION IN ILLINOIS THIS YEAR

Mr. P. A. Glenn of the Illinois State Department of Agriculture has recently written the office of Cereal Investigations concerning the 1925 survey for flagsmut of wheat (Urocystis tritici) in Illinois. He reports as follows on May 28 and June 12:

Table 2. First observation of stem rust on barberry
(Data from Rust Reporter, April 27 and May 29, 1925, except where indicated)

Date	Place	State	Observer
April 18	Montgomery Co., Ohio	Pycnia	Beck
April 23	Story Co., Iowa	Aecia	Smith
April 25	Harrison Co., Missouri	Pycnia & Aecia	Fletcher
April 25	St. Joseph Co., Michigan	------	Reddy
April 26	Jackson Co., Michigan	------	Reddy
April 26	Polk & Hamilton Cos., Nebraska	------	Thiel
April 27	Ohio	Aecial cups	Baringer
April 27	Dane Co., Wisconsin	Pycnia	Thompson & Walker
May 1	Olmstead Co., Minnesota	Pycnia	Melander
May 4	Stephenson Co., Illinois	Pycnia	Fobes & Lafferty
(May 5)	(LaGrange Co., Indiana)	(Aecial cups)	(Cereal Courier 17: 142. June 10; Leer)
May 9	Clark Co., South Dakota	Pycnia & Aecia	Bulger
May 12 (probably infected before April 20)	Northeastern corner of Indiana	Aecia	Leer
May 30	Smith Co., Kansas	Pycnia	Fletcher
June 2	Morton Co., North Dakota	Aecial cups	Mayone (spec. sent in)

Table 3. Spread of rust to cereals and grasses (first reports).
(Data from Rust Reporter, June 15 and 23, 1925)

Date	State	County	Abundance	Host	Observer
May 20	Nebraska	Hamilton	Trace	Hordeum jubatum	Thiel
May 25	Kansas	Republic	Trace	Agrostis alba	Lungren
May 26	Missouri	Marion	Trace	Agrostis alba	Frolick & Lambert
June 8	Wisconsin	Dane	Trace	Agropyron repens	Walker
June 8	Illinois	Lake	--	Barley	Fobes & Lafferty
June 10	Ohio	Preble	Trace	Wheat	Dobbins
June 12-13	Kansas	Republic	—	Wheat	Lungren & Butler
June 15	Minnesota	Kittson	Trace+	Wheat	Olsen & Baker
June 15	Michigan	Manistee	—	Agrostis alba	Moore & Boyd
June 16	South Dakota	Clark	Trace-15%	Hordeum jubatum	Errington
June 19	Iowa	—	—	Hordeum jubatum	Smith & Christensen

"We have completed a survey of the counties in the vicinity of East St. Louis for this year. We were unable to find any in Jersey County. We found considerable in Madison County in the old generally infested area. The same is true of St. Clair County. On one farm, the Wm. Metter farm, where it was so bad four years ago, we found the infestation about 30% in his Fultz wheat. In one place in his field he had three strips of wheat sowed. They were Fultz, Red Republic, and Shepherd. The Fultz had an infestation of about 30%, the Red Republic 2.5% and the Shepherd none. In Monroe County flagsmut was found this year in only one place, that was on the extreme north side of the county.

"In the generally infested area we aimed to inspect a representative number of fields for the purpose of ascertaining whether the infestation was getting more severe or less severe, but we aimed to visit all the outlying farms where infestations were found last year or the year before. We found considerably more flagsmut this year than last but apparently the severe winter a year ago nearly exterminated the disease from some of the area and the infestation this year is generally very slight. The disease seems to be coming back a little but very slowly. Somewhat over 100 farmers in the infested counties have sowed resistant varieties this year and they are nearly all very well satisfied with it." (May 28)

"Our flagsmut survey this year is drawing to a close. We have not found any flagsmut in any new counties. During the season we will have covered about 30 counties, including the ones in which infestations were found and surrounding counties. We failed to find any flagsmut in Jersey, Macoupin, and Washington Counties this year. Hancock has not yet been surveyed, but I do not anticipate that we will find any there. We have found it in all the other counties more abundant than last year, but not so abundant as three years ago.

"Flagsmut received a great setback year before last and has not yet recovered. We have not found any serious infestations except where susceptible varieties of wheat were sown and rotation was not practiced." (June 12)

TAKEALL OF WHEAT (OPHIOBOLUS GRAMINIS)

A. G. Johnson of the office of Cereal Investigations reported on June 1 that takeall was found recurring with considerable virulence in experimental plots at Lincolnton, North Carolina.

In the last number of this Reporter (Vol. 9: 2, June 15, 1925) the statement was made that takeall was found by the agent of Daire County. The name of this county was misspelled, it should be Davie County.

LOOSE SMUT OF OATS PREVALENT IN TEXAS AND OKLAHOMA

"In general, Red Rustproof and Fulghum oats in Texas and Oklahoma are badly infected with smut. Many fields looked as though the infection might run as high as 25%. This unusually high smut infection apparently has resulted from the peculiar dry winter and spring. In fact, the writer never has observed a heavier smut infection in such susceptible varieties as Aurora and Early Champion of the Avena sativa group. In Texas, fall-sown oats showed a decidedly lower infection than those sown in February. (T. R. Stanton, Cereal Courier 17: 136. June 1-10, 1925)

FRUIT DISEASES

NEW YORK FIELD ASSISTANTS REPORT ON APPLE SCAB SITUATION

In the New York State College of Agriculture Weekly News Letter of the Departments of Plant Pathology and Entomology for June 8, 1925, the following reports concerning apple scab in the different counties were made. Since details concerning this important disease in New York are of interest these reports are repeated.

Onondago County - Some apple scab injury on foliage is showing up as a result of the rainy period just at the close of blossoming. Very little of the calyx application was applied prior to the rain. (D. D. Ward)

Ontario County - Sprayed and dusted apple orchards are very clean as regards scab, but three unsprayed orchards showed 30% of the leaves to have scab lesions on Baldwin and King. (A. B. Burrell)

Wayne and Oswego Counties - Apple scab is beginning to show up on the fruit but is very scarce on both leaves and fruit in orchards which have received the full schedule. (W. D. Mills)

Orange County - Infection which apparently took place during the blossoming period is very widespread in the county. Some scab injury has been observed on the fruit. A severe hail storm in the lower half of the county cut fruit badly. (A. D. Long)

Columbia County - Very noticeable in some orchards both on leaves and fruit. (A. B. Bucholz)

Dutchess County - Observed in several orchards and in a few cases the infection is severe. This disease was noted on the fruit June 4. (G. E. R. Hervey)

Greene County - Abundant on the leaves in some McIntosh orchards which did not receive a preblossom spray before the rain. (A. S. Mills)

Orange County - Infection is showing up in blocks that left out the pre-blossom applications. (A. D. Long)

Orleans County - Getting abundant where no delayed dormant applications were made. Many orchards have not yet been sprayed on the east side with the calyx spray. (R. G. Palmer)

Ulster County - Apple scab is showing up. In general it is not of much importance. (C. C. Wagoner)

Wayne County - Heavy primary spore discharge during the rains of May 31. (W. D. Mills)

APPLE CEDAR RUST

Cedar rust infections began to show up on apple leaves in the Hudson River Valley in New York during the first week in June. (New York State College Weekly News Letter, June 8.)

STRAWBERRY ROTS IN ARKANSAS

Grey mold rot (Botrytis sp.)

This type of rot rather common on local market at Fayetteville. (Dept. Pl. Path.)

Leather rot (Phytophthora cactorus (Leb. & Cohn.) Schroet.

This rot apparently caused by Phytophthora is prevalent to a limited extent. The field reports were not plentiful. Dry weather appears not to have favored rot in the field. (Dept. Pl. Path.)

Market inspection reports, on cars of Arkansas strawberries arriving in northern markets, show that leather rot was not so prevalent as is often the case, the percentage of infected berries being reported as a trace to 5%. Dry weather during, and prior to harvest, seems to have been the principle factor in keeping the rot in check.

POP-CORN DISEASE OF MULBERRY

W. L. Blain of the Alabama Experiment Station writes June 11, that he has recently received two specimens of the pop-corn disease of mulberry from different parts of the state.

REPORTS ON POTATO DISEASES FROM ARKANSAS

H. R. Rosen and V. H. Young of the Department of Plant Pathology, Fayetteville, report as follows on potato diseases as of June 15:

Bacillus phytophthorus, blackleg - Noted in localized area on University Farm. Apparently brought in on seed.

Bacterium solanacearum, bacterial wilt - Caused scattered injury in vicinity of Ft. Smith. No other reports received.

Fusarium sp,, wilt - Sent in from Ft. Smith. Not serious,from reports.

Leafroll, cause unknown - Rather prevalent.

Tipburn - Very prevalent and causing considerable damage. Could not be associated with leaf hoppers in many cases.

POTATO MOSAIC

Three states have sent in notes on mosaic of potatoes. Other reports of mosaic from pathologists working on potato diseases are desired in order that any outstanding developments may be recorded.

Louisiana: This disease was found rather generally in the fields over the state, but evidently not as bad as it has been in previous years. (Edgerton & Tims, June 15)

Arkansas: Very prevalent, especially on locally grown Bliss Triumph. As much as 95% noted. (Rosen, June 15)

New Mexico: Common in Dona Ana County. (Crawford, June 15)

CABBAGE YELLOWS (FUSARIUM CONGLUTINANS)

Texas: Fairly prevalent throughout the state. (Taubenhaus, June 15)

Arkansas: Reported as very serious early in May in southern part of state. (V. H. Young, June 15)

LOUISIANA REPORTS ON SUGAR BEET DISEASES

C. W. Edgerton and E. C. Tims report on sugar beet diseases for Louisiana as follows on June 15:

Cercospora beticola, leafspot - This disease has been rather common in some plantings of sugar beets in East Baton Rouge and Iberville Parishes since the first of June.

Phoma betae, leafspot - This leafspot appeared in the planting of sugar beets on the University Experiment Station farm, and was quite severe on May 20. This is probably the first report of this disease in Louisiana.

Sclerotium rolfsii, Sclerotium rot - This rot has been present in the planting of sugar beets on the University Experiment Station farm since May 15, causing some little damage.

STEMROT OF SWEET POTATO IN ARKANSAS

"Stemrot causing as much as 50% loss of newly planted slips reported. Disease very severe on artificially infested soil. Very warm, dry weather apparently especially favorable." (V. H. Young, June 15)

TOBACCO WILDFIRE IN MARYLAND

Wildfire (Bacterium tabacum) was serious in plant beds in southern Maryland this season. It is always worse in the seed beds than in the fields in that state and so the seed bed problem is especially important. Growers were urged to spray or dust the young plants with Bordeaux. Where this was done the disease was successfully checked. (Information from R. A. Jehle, May 29)

STEM NEMATODE FOUND ON WILD LARKSPUR

Mr. F. D. Bailey of Corvallis, Oregon, found wild larkspur (Delphinium trolliifolium) infested with a stem nematode, March 24, 1925, near Corvallis, Oregon. Specimens sent to Doctor Steiner of the Office of Agricultural

Technology, Bureau of Plant Industry, were examined by him and the organism determined as Tylenchus dipsaci. Mr. Bailey says,

> "The infestation on the larkspur results in a host reaction similar to that produced in other hosts, a dwarfing with hypertrophy and dark decomposition of stems at the crown which causes easy breaking at this point. Infestation was found within leaves as well as stems but no infestation of floral parts has been seen.
>
> "The suggestion is that we have only roughly hit a few of the high spots thus far and doubtless many more hosts will be found and distribution of infestations now known will be extended. At present the bulb growers are the parties most concerned over this pest in the Northwest."

STEM AND BULB NEMATODE ON NARCISSUS

Mr. F. D. Bailey of Corvallis, Oregon, writing May 25, 1925, reports as follows concerning the finding of Tylenchus dipsaci in a narcissus plantation near Salem, Oregon:

> "On May 18 I inspected a half acre two-year old plot which showed 24% infestation, scattered, while one-half acre planted last fall, imported the year previous showed less than 0.5%. While conditions were not exactly comparable, since the source may be different, the handling in this country has been practically the same, but a year apart."

1925 CEREAL DISEASE CONFERENCE

Printed programs of the 1925 summer field meeting of the American plant pathologists on the subject of cereal diseases have just been received. This meeting will be held from July 8 to 14 and will commence at Ames, Iowa, on the 8th where conferences will be held and the college farms and experimental plots visited. An automobile tour from Ames to St. Paul, Minnesota has been arranged for July 9 and 10. July 11 and 12 will be spent at University Farm, St. Paul and on the evening of the 12th the members of the conference will leave for Fargo, North Dakota where the meeting will be continued and concluded the next day. It is hoped that as many collaborators as can will attend. Those

desiring more information should communicate with . E. Melhus, E. C. Stakman, H. L. Bolley, A. T. Evans, or H. B. Humphrey, who are in charge of arrangements.

NOTICE CONCERNING PRELIMINARY ESTIMATES OF CROP LOSSES

On June 15 the preliminary crop loss estimates for the year 1924 were submitted to collaborators and others with the request that additions and corrections be made and this office notified. As yet only a few replies have been received. Since it is rather important that these estimates be put in final form as soon as possible, collaborators should send in their revisions at an early date.

A LIST OF PLANT DISEASES IN THE UNITED STATES

Manuscript of a paper entitled "A Check List of Diseases of Economic Plants in the United States," prepared in the Plant Disease Survey, has been submitted for publication as a Department Bulletin. This list, which will occupy approximately one hundred pages, is arranged alphabetically according to scientific name of the crop; and under each crop the diseases are arranged according to the scientific name of the causal organism. In connection with each disease, the common name and the geographic range as it is know, is given.

SOME SPECIMENS THAT HAVE BEEN RECEIVED THIS SEASON

Forage Crops

Ascochyta pisi Lib., on vetch from Kentucky.
Cercospora medicaginis Ell. & Ev., on burr clover from Georgia.
Colletotrichum sp. (stemspot) on burr clover from Georgia.
Mosaic on crimson clover from Virginia.
Peronospora trifoliorum D By., downy mildew on alfalfa from Kentucky.
Sclerotinia trifoliorum Eriks., rootrot of crimson clover, from Virginia (see text).

Vegetable Crops

Bacterium solanacearum EFS., on eggplant from South Carolina.
Cercosporella albo-maculans (Ell. & Ev.) Sacc., leafspot of turnip from Georgia.

Colletotrichum atramentarium (Berk. & Br.) Taub., anthracnose or black dot on stem of Irish potato from Norfolk section of Virginia.

Fusarium sp., causing a root rot of snap beans in South Carolina. A twenty-five acre field was being badly damaged.

Fusarium niveum EFS., wilt of watermelon from Fort Valley, Georgia, June 6.

Fusarium vasinfectum Atk., wilt of cotton from Valley Park, Miss., June 16.

Septoria lactucae Pass., on lettuce from South Carolina.

Fruit Crops

Diplocarpon earliana (Ell. & Ev.) Wolf. The Marssonia stage of this fungus was received on wild strawberries from Berkeley, California. Material collected by W. T. Horne and determined by F. A. Wolf.

Sclerotinia carunculoides Siegler & Jenkins, popcorn disease of mulberry, collected May 19, was received from O. C. Boyd of Georgia.

Sclerotinia fructicola (Wint.) Rehm. on sweet cherries from Wallingford, Connecticut. This is the American brownrot fungus formerly called Sclerotinia cinerea (Bon.) Schroet., and designated by some as Sclerotinia americana (Wormald) Norton & Ezekiel.

Tylenchus semipenetrans Cobb. Dried citrus roots received from C. P. Lounsbury, Pretoria, South Africa were found to be heavily infested with this nema.

Other Crops

Alternaria panax Whetzel on ginseng from Bruceton Mills, West Virginia.

Aphelenchus olesistus on begonia leaves from Beaver, Pennsylvania.

Leptosphaeria coniothyrium (Fckl.) Sacc. on rose from Norfolk, Virginia.

Powdery mildew, apparently Uncinula australiana McAlp. on crepe myrtle from Georgia and South Carolina.

Sclerotium delphinii D. S. Welch, crown rot on Delphinium (Annual larkspur) from Long Island, New York.

Taphrina coerulescens (Mont. & Desm.) Tul. on Quercus sp. from Due West, South Carolina.

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